:**Complementary- Claim –V: pp 7 :Cancellation: Disease-Model: Health-Care**. :Change-now is: Medicine-Health-Healing and Cure-Care-Model by the Heal-Cure-Model >as the Disease-model is with the in-herent -socialism-risk of the common-harm upon the USofA-1776-AD-People -DOI-1776-AD -Constitution -Covenant- duty.

EUROPEAN RESPIRATORY *journal*
FLAGSHIP SCIENTIFIC JOURNAL OF ERS

Check for updates

The disease model: implications for clinical practice

Alvar Agusti

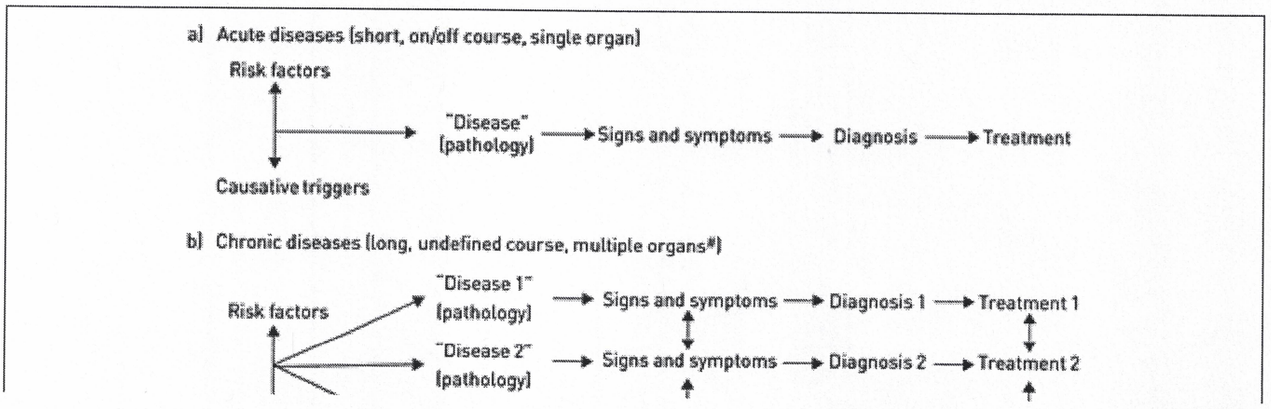
European Respiratory Journal 2018 51: 1800188; **DOI:** 10.1183/13993003.00188-2018

Tweetable abstract @ERSpublications

click to tweet

Chronic noncommunicable diseases challenge the traditional "disease model" of acute diseases and it is proposed here that their clinical management requires a different "disease model" based on the presence of so-called treatable traits http://ow.ly/9Zl930iYZX3

Since the most remote origins of medicine, thousands of years ago, clinical practice has been based on the so-called "disease model" [1]. As shown in **figure 1a**, this model establishes that a number of risk factors and causative triggers interact to produce a "disease" characterised by specific pathology that manifests by a series of symptoms and signs which, importantly, guide the diagnosis and treatment of the "disease". More recently, this paradigm has been enriched by the use of complementary diagnostic techniques that are used to confirm (or refute) the clinical diagnosis (as well as the proposed treatment).



THANK YOU FOR ACCEPTING COOKIES

You can now hide this message or find out more about cookies.

Hide More info

Open in new tab

Download powerpoint

FIGURE 1

Pictorial representation of a) the traditional disease model, which is appropriate for acute diseases, and b) a more complex model that describes more realistically what happens in chronic noncommunicable diseases. #: nonbiological factors (social, familial, life-style and others) can play a significant role in what most often matters to patients: symptoms.

This simple "disease model" generally works well for acute diseases in otherwise healthy subjects because they most often involve a single organ system and have a well-defined and short clinical course (*e.g.* trauma, infections and many others). However, this is not the case when we consider the clinical management of chronic, noncommunicable diseases which, today, are far more prevalent than acute diseases [**1**]. In fact, chronic noncommunicable diseases have been identified by the General Assembly of the United Nations as the main public health problem we face at the beginning of the 21st century [**2**]. Furthermore, somewhat ironically, this is in part due to the success we have had managing acute diseases. For instance, mortality due to coronary artery disease has decreased significantly over the last decades [**3**]. This has led to a clear increase in life expectancy that opens the possibility of suffering other chronic diseases, such as chronic obstructive pulmonary disease [**4**].

The "disease model" of chronic noncommunicable diseases (**figure 1b**) is far more complex than that of acute diseases (**figure 1a**). It includes more risk factors and triggers that often interact (*e.g.* ageing and smoking) to damage several organ systems (*e.g.* cardiovascular and respiratory) simultaneously. As a result, the symptoms perceived by the patient may have a multi-site origin. This makes a precise diagnosis and a specific treatment difficult and, as a result, these patients often end up receiving multiple therapies at the same time that can also interact [**1**]. Finally, it is also of note that the clinical management of chronic noncommunicable diseases has to consider nonbiological aspects, such patient preferences and family and social support, which often determine compliance with therapy and directly influence the clinical outcome [**1**]. All in all, the original and simple "disease model" (**figure 1a**) probably needs to be abandoned when managing chronic noncommunicable diseases. The question is then, what is the alternative model, if any?

One of the anonymous reviewers of this article argues that we may not need a disease model at all because artificial intelligence (AI) will revolutionise medicine in such a way that it will never be the same any more (medicine 3.0) [**5**]. Although I agree that this is certainly a possibility, I also believe that in the meantime we still need some kind of "disease model" to work with. In this context, a potential alternative model for the clinical management of chronic noncommunicable diseases may be based on the so-called "treatable traits" [**6**–**8**], which explicitly avoids the old, restrictive, Oslerian diagnostic labels that accompany the traditional "disease model" [**9**]. A treatable trait can be identified on the basis of phenotypic (clinical) recognition or through a deeper understanding of the causal pathways

THANK YOU FOR ACCEPTING COOKIES

You can now hide this message or find out more about cookies.

Hide More info

The current availability of electronic health records should easily allow us to build a "control panel" (similar to those that pilots use in aeroplane cabins to fly safely and effectively) that presents the treatable traits present in any given individual to the practising clinician in a user-friendly manner [**11**]. Furthermore, current computing power and AI strategies [**5**] can conspire to curate the current guidelines plethora [**1**] and present the practising clinician with a precision medicine strategy that provides the best therapeutic options to the specific patient she/he is taking care of, based on both guideline recommendations and specific needs of the patient. Needless to say, this proposal requires formal prospective validation in appropriately designed clinical trials. Yet, it offers a potential alternative to implement a new "disease model" for chronic noncommunicable diseases. In fact, as suggested by another reviewer, good clinical practice in multimorbid patients is already based on treatable traits because there is no alternative way to approach these patients and, indeed, an inter-societal working group, involving the European Respiratory Society and other stakeholders (particularly the internal medicine community), may be needed to change textbooks, curricula and organisation of care in order to translate this message to clinical practice.

Acknowledgements

I would like to sincerely thank the two anonymous reviewers of this article for their very helpful comments and suggestions, which are now included in the text and have, in my mind, contributed significantly to enrich it.

Footnotes

- Conflict of interest: A. Agusti reports grants from GSK, personal fees from Novartis and Chiesi (for lectures), grants and personal fees from Astra-Zeneca and personal fees from Boheringer-Ingelheim (for lectures and advisory boards), outside the submitted work.

Received January 29, 2018.

Accepted February 20, 2018.

Copyright ©ERS 2018

References

1. ↵Tinetti ME, Fried T. The end of the disease era. *Am J Med* 2004; **116**: 179–185. **CrossRef PubMed Web of Science Google Scholar**

2. ↵Rosenbaum L, Lamas D. Facing a "slow-motion disaster" – the UN meeting on noncommunicable diseases. *N Engl J Med* 2011; **365**: 2345–2348. **CrossRef PubMed Web of Science Google Scholar**

3. ↵Rosamond WD, Chambless LE, Folsom AR, et al. Trends in the incidence of myocardial infarction and in mortality due to coronary heart disease, 1987 to 1994. *N Engl J Med* 1998; **339**: 861–867. **CrossRef PubMed Web of Science Google Scholar**

THANK YOU FOR ACCEPTING COOKIES

You can now hide this message or find out more about cookies.

Hide More info

457

Google Scholar

6. ↵Agusti A, Bel E, Thomas M, et al. Treatable traits: toward precision medicine of chronic airway diseases. *Eur Respir J* 2016; **47**: 410–419. **Abstract/FREE Full Text** **Google Scholar**

7. ↵Agustí A, Bafadhel M, Beasley R, et al. Precision medicine in airway diseases: moving to clinical practice. *Eur Respir J* 2017; **50**: 1701655. **Abstract/FREE Full Text** **Google Scholar**

8. ↵Pavord ID, Beasley R, Agusti A, et al. After asthma: redefining airways diseases. *Lancet* 2018; **391**: 350–400. **Google Scholar**

9. ↵Vanfleteren LE, Kocks JW, Stone IS, et al. Moving from the Oslerian paradigm to the post-genomic era: are asthma and COPD outdated terms? *Thorax* 2014; **69**: 72–79. **Abstract/FREE Full Text** **Google Scholar**

10. ↵Agusti A, Celli B, Faner R. What does endotyping mean for treatment in chronic obstructive pulmonary disease? *Lancet* 2017; **390**: 980–987. **Google Scholar**

11. ↵Agusti A, MacNee W. The COPD control panel: towards personalised medicine in COPD. *Thorax* 2013; **68**: 687–690. **Abstract/FREE Full Text** **Google Scholar**

We recommend

Precision medicine in airway diseases: moving to clinical practice
Alvar Agustí et al., European Respiratory Journal, 2017

Pulmonary medicine and (adult) critical care medicine in Europe.
T Evans et al., European Respiratory Journal, 2002

Chronic disease in the elderly: back to the future of internal medicine
L.M. Fabbri et al., Breathe, 2006

The quality of evidence-based clinical practice guidelines for chronic respiratory diseases could be improved: An observational study
Fabiano Lima et al., European Respiratory Journal, 2016

Interstitial lung diseases: course report
Michael Kreuter et al., Breathe, 2019

Headline: HIV-associated wasting prevalence in the era of modern antiretroviral therapy
Javeeda Siddiqui et al., AIDS, 2022

Content analysis of clinical questions from Australian general practice which are prioritised for answering: identifying common question types and perceived knowledge gaps
Danielle Marie Muscat et al., Evid Based Med, 2020

Evidence Based Medicine and Examination Skills: Translating Theory to Practice
Neel Sharma, World Scientific Book, 2019

Trends in Antimicrobial Prescribing for Bronchitis and Upper Respiratory Infections Among Adults and Children
Arch G. Mainous et al., Am J Public Health, 2011

The value of clinical practice guidelines in hematology
Julie A. Panepinto et al., Blood Advances, 2018

Powered by TREND MD

Previous Next

THANK YOU FOR ACCEPTING COOKIES

You can now hide this message or find out more about cookies.

Hide More info

458

Vol 51 Issue 4 Table of Contents

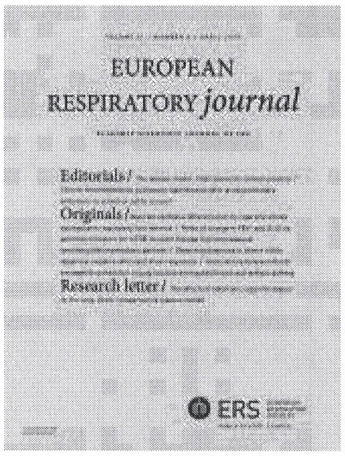


Table of Contents
Index by author

Email
Print
Citation Tools
Request Permissions
Share
Full Text (PDF)

Jump To

- Article
  - Abstract
  - Acknowledgements
  - Footnotes
  - References
- Figures & Data
- Info & Metrics
- PDF

THANK YOU FOR ACCEPTING COOKIES

You can now hide this message or find out more about cookies.

Hide More info

459

More in this TOC Section

Related Articles

No related articles found.

Web of Science PubMed Google Scholar

Navigate

Home
Current issue
Archive

About the ERJ

Journal information
Editorial board
Reviewers
Press
Permissions and reprints
Advertising

The European Respiratory Society

Society home
myERS
Privacy policy
Accessibility

ERS publications

THANK YOU FOR ACCEPTING COOKIES

You can now hide this message or find out more about cookies.

Hide More info

460

ERS Bookshop

Help

Feedback

For authors

Instructions for authors
Publication ethics and malpractice
Submit a manuscript

For readers

Alerts
Subjects
Podcasts
RSS

Subscriptions

Accessing the ERS publications

Contact us

European Respiratory Society
442 Glossop Road
Sheffield S10 2PX
United Kingdom
Tel: +44 114 2672860
Email: journals@ersnet.org

ISSN

Print ISSN: 0903-1936
Online ISSN: 1399-3003

Copyright © 2022 by the European Respiratory Society

THANK YOU FOR ACCEPTING COOKIES

You can now hide this message or find out more about cookies.

Hide More info